

April 15, 2013

North Carolina Department of Environment and Natural Resources (NCDENR)  
Division of Waste Management – Solid Waste Section  
1646 Mail Service Center  
Raleigh, North Carolina 27699-1646

**Reference: C&D Assessment for Lincoln County Landfill**  
***(PCE Exceedances in Groundwater Monitoring Well MW-28)***  
Lincoln County Landfill (Permit No. 55-03)  
Crouse, North Carolina  
S&ME Project No. 1356-13-009

Dear Ms. Drummond:

S&ME, Inc. (S&ME), on behalf of Lincoln County (County), is acknowledging the above referenced condition regarding the Lincoln County Landfill. At this time, the County and S&ME are undertaking steps in response to detections of Tetrachloroethane (PCE) that exceed the NCAC 2L .0202 Groundwater Quality Standards (2L standards) in monitoring well MW-28. This letter summarizes the proposed.

## **PROJECT HISTORY**

Concentrations of PCE in monitoring well MW-28 have exceeded 2L standards since April 2008 and have been generally increasing in concentration since that time. Monitoring well MW-28 monitors groundwater upgradient of the C&D Landfill and is positioned in-between the unlined MSW landfill “Area E” and the C&D Landfill. Phase I of the C&D landfill was closed with an intermediate cover and remains hydraulically connected to Phase II of the C&D Landfill, therefore; 15A NCAC 13B.0545 (*Assessment and Corrective Action Program for C&D Landfill Facilities and Units*) is applicable.

## **PROJECT DESCRIPTION**

Based on PCE exceedances in monitoring well MW-28 and the applicable rules, S&ME and the County will begin the C&D Assessment Program by installing one (1) compliance boundary well down-gradient of existing monitoring well MW-28 at the proposed location shown on the attached ***Drawing 1 of 1***. Upon your approval of the proposed well location, S&ME, on behalf of the County will proceed with the following tasks.

### ***Drilling and Well Installation Services***

S&ME will drill the boring for boundary groundwater monitoring well using an all-terrain drill rig. The monitoring well will be installed in the borehole in accordance with the appropriate 15A NCAC 2C standards. A North Carolina registered geologist and North Carolina registered well driller will be on-site during well installation activities.

Drilling equipment and tooling will be decontaminated using a high pressure steam cleaner prior to arriving on-site. The boring will be advanced using 4 1/4-inch hollow stem augers with split-spoon soil samples collected every five (5) feet to a depth approximately 10-feet below the stabilized groundwater surface elevation.

Following boring completion, S&ME will construct a Type II monitoring well within the borehole such that the well screen is positioned to be approximately 10-feet below the shallow groundwater surface. The well will be constructed of 2-inch schedule 40 PVC screen and casing and have a 15-foot long, 0.010-inch slotted screen. The annulus of the borehole surrounding the screen will be backfilled with #2 silica sand to approximately two feet above the top of the screen. Above the sand interval, an approximate 2-foot thick bentonite seal will be placed and hydrated prior to filling the remaining annular space with neat cement grout.

After construction, the well will be completed with an above grade 4-inch lockable steel protective cover and 2-foot square concrete pad. S&ME will provide, engrave, and attach a permanent well tag to the protective cover in accordance with North Carolina well regulations.

S&ME will prepare and submit a well construction record to the NCDENR-DWQ within 30-days of well completion.

### ***Well Development***

Following well installation, the newly installed boundary groundwater monitoring well will be developed to reduce the amount of clay, silt, and sand particles that may have been introduced into the formation or filter pack during installation and to establish communication of the well with the aquifer. Development will be conducted as soon as practical after well installation. Development will be performed using a field-cleaned well pump and polyethylene tubing. Development will be conducted by removing field specified amounts of water from the well while moving the pump up and down the well screen. Development will continue until the water removed appears visually clear or a minimum purge of five well volumes is achieved.

### ***Rising-Head Permeability Tests “Slug Tests”***

Approximately 24-hours following well development, S&ME will perform a rising-head permeability test, (“slug test”), in the newly installed groundwater monitoring well. A slug test will be used to evaluate the horizontal intrinsic permeability or hydraulic conductivity of the subsurface materials surrounding the saturated portion of the screened interval, which is required for estimation of groundwater velocities during semi-annual reporting.

A slug test will be performed by removing a field specified amount of water from the well using a field-cleaned well pump. The well will then be allowed to recharge as measurements of increasing water level with time are recorded using a pressure transducer and data logger. Rising head hydraulic conductivity will then be computed from the field data using the Bouwer and Rice graphical method.

### ***Surveying***

Upon completion of field activities, a North Carolina registered land surveyor will survey the well including the state plane coordinates, ground surface elevation, and top of casing elevation. The survey information will be incorporated into the boring and well logs, as well as an updated Groundwater Monitoring Well Location Map.

### ***Reporting***

Upon completion of well installation activities, S&ME will submit a report on behalf of Lincoln County to the NCDENR- SWS that will include at a minimum the following information:

- Description of field activities;
- Boring log, well log, and well construction record for the new well;
- Results and calculations for hydraulic conductivity and effective porosity estimates; and
- Updated Groundwater Monitoring Well Location Map.

As mentioned previously, S&ME will also prepare and submit under separate cover, well construction records to the NCDENR-DWQ within 30-days of well completion.

S&ME anticipates that reporting for the boundary well installation will take approximately two (2) weeks following conclusion of field activities.

### ***Assessment Monitoring Work Plan***

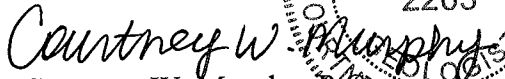
Following boundary well installation and reporting activities, S&ME will prepare a work plan and schedule in accordance with 15A NCAC 13B .0545(b). As per the rules, S&ME will prepare a work plan that provides proposed additional monitoring wells to characterize the nature and extent of the release and proposed additional monitored parameters.

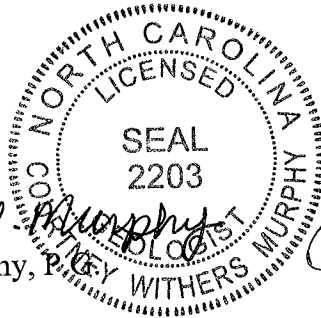
S&ME intends to design the work plan toward an alternate source demonstration in an effort to establish the unlined Area E as the source of the elevated PCE concentrations in groundwater monitoring well MW-28.


## CLOSURE

Please be aware that Lincoln County considers the protection of human health and the environment to be of paramount concern. Lincoln County is committed to providing the resources necessary to address NCDENR's concerns at the Lincoln County Landfill property and intends to work closely with NCDENR to address these issues. Please call S&ME at (704) 523-4726 if you have any questions or comments, or if we can be of further assistance.

Sincerely,  
S&ME, Inc.

  
Courtney W. Murphy, P.G.  
Project Geologist



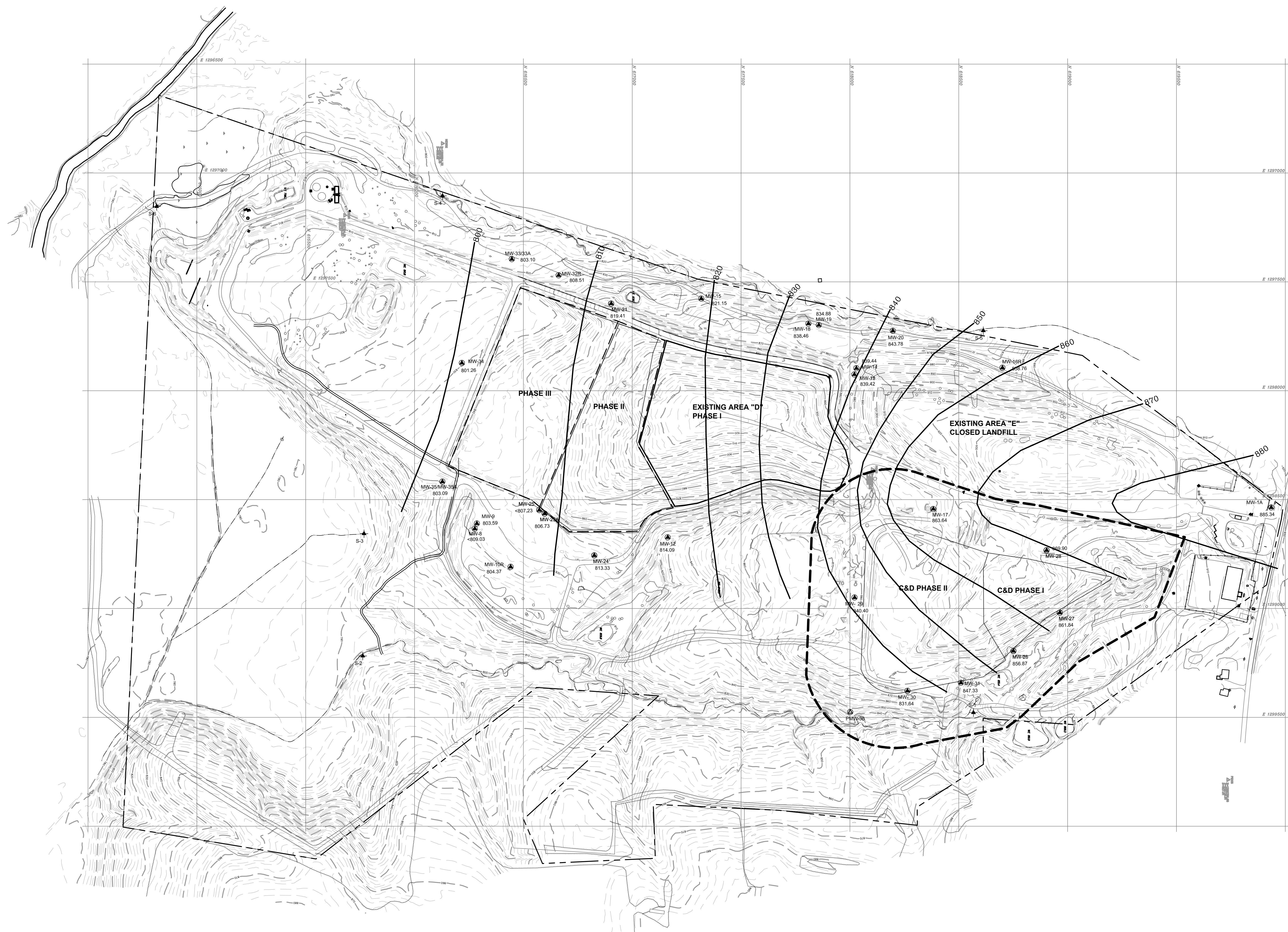
  
Julie R. Petersen, P.G.  
Senior Geologist

Senior Reviewed by: Jason S. Reeves, P.E.

Attachment: Drawing 1 of 1

cc: Mark Bivins - Lincoln County Solid Waste Manager





REFERENCE:  
TOPOGRAPHIC SURVEY FOR LINCOLN COUNTY LANDFILL BY SPATIAL DATA CONSULTANTS INC., DATED  
APRIL 7, 2010.

GRAPHIC SCALE

## PROPOSED MONITORING WELL LOCATION MAP C & D ASSESSMENT

LINCOLN COUNTY LANDFILL  
5291 CROUSE ROAD  
CROUSE, NORTH CAROLINA



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